

The Effect of Auditory-Motor Synchronization on Physiological Responses and Perceived Exertion During Treadmill Running: 2124: Board #95 May 30 8:00 AM - 9:30 AM

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(No relationships reported)

Many studies have explored the impact of musical accompaniment during exercise, but few directly explored the neurological and physiological effects of facilitative music.

PURPOSE: To determine the effect of synchronization to an external, auditory stimulus on oxygen consumption (VO_2), blood lactate (BLa), heart rate (HR), and ratings of perceived exertion (RPE) during submaximal exercise.

METHODS: Eight subjects (25.6 ± 3.3 yr) participated in one assessment trial and three experimental trials. During the assessment trial, subjects performed a $\text{VO}_{2\text{max}}$ test, and after a 10-min rest period, step frequency (SF) was calculated at a velocity approximating 70% of $\text{VO}_{2\text{max}}$. During the experimental trials, subjects ran for 20 min at 70% $\text{VO}_{2\text{max}}$ on a motorized treadmill with synchronous (SC), asynchronous, (AS) and no music (NM), where the order of trials was randomly assigned to each participant. Musical selections were identical with the exception of tempo (beats/min). During the SC condition, tempo equaled SF, and during the AS condition, tempo equaled 70% of SF. VO_2 , BLa, HR, RPE, and SF were recorded every five min. Statistical analysis was performed using a two-way ANOVA (music condition \times time) with repeated measures.

RESULTS: Overall, there were no significant differences between the music conditions for SF (SC: 162 ± 11 , AS: 163 ± 11 , NM: 163 ± 11 steps/min; $P > 0.05$), RPE (SC: 11.7 ± 1.4 , AS: 11.8 ± 1.3 , NM: 11.8 ± 1.2 ; $P > 0.05$), HR (SC: 162 ± 14 , AS: 163 ± 12 , NM: 160 ± 12 bpm; $P > 0.05$), VO_2 (SC: 32.8 ± 4.5 , AS: 32.8 ± 4.7 , NM: 32.7 ± 3.9 mL/kg/min; $P > 0.05$), and BLa (SC: 2.6 ± 2.2 , AS: 3.0 ± 2.0 , NM: 2.6 ± 1.8 mmol/L; $P > 0.05$). There was a significant main effect for time for all the dependent variables ($P < 0.05$) excluding FS ($P > 0.05$). The music condition \times time interactions were not significant for all the dependent variables ($P > 0.05$).

CONCLUSION: Synchronous music did not have a significant effect on RPE or any of the physiological responses. One possible explanation may be that since a motorized treadmill provides kinesthetic feedback, the effects of auditory-motor cuing are minimized. Future considerations may include more accurate measurement of synchronization, well-trained athletes, and subject-preferred speed and grade.

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